

| The height of the Cylinder of Mercury, that, together with the Elater of the included Air, ballanced the pressure of the Atmosphere. | The Expansion of the Air. | The height of the Mercury that counterballanc'd the Atmosphere | The strength of the Elater of the expanded Air. |
|--|---------------------------|--|---|
| 00   | 01                        | 30   | 30  |
| 02   | 01 $\frac{1}{16}$         | 30   | 28  |
| 04   | 01 $\frac{1}{7}$          | 30   | 26  |
| 06   | 01 $\frac{1}{9}$          | 30   | 24  |
| 08   | 01 $\frac{1}{11}$         | 30   | 22  |
| 10   | 01 $\frac{1}{12}$         | 30   | 20  |
| 12   | 01 $\frac{1}{13}$         | 30   | 18  |
| 14   | 01 $\frac{1}{14}$         | 30   | 16  |
| 16   | 02 $\frac{1}{17}$         | 30   | 14  |
| 18   | 02 $\frac{1}{9}$          | 30   | 12  |
| 20   | 03                        | 30   | 10  |
| 22   | 03 $\frac{2}{9}$          | 30   | 8   |
| 24   | 05 $\frac{7}{18}$         | 30   | 6   |
| 25   | 06 $\frac{1}{3}$          | 30   | 5   |
| 26   | 08 $\frac{1}{2}$          | 30   | 4   |
| 26 $\frac{1}{4}$   | 09 $\frac{1}{2}$          | 30   | 3 $\frac{1}{4}$                                 |
| 26 $\frac{1}{2}$   | 10 $\frac{3}{4}$          | 30   | 3 $\frac{1}{2}$                                 |
| 26 $\frac{3}{4}$   | 13                        | 30   | 3 $\frac{1}{4}$                                 |
| 27   | 15 $\frac{1}{2}$          | 30   | 3   |

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I had several other Tables of my Observations, which I then made; but it being above a twelve months, and by that means having forgot many particulars, I was resolv'd to make them over once again, *August* the second 1661. with the very same Tube which before, when I first made the Experiment (for it being one, I had carefully preserv'd it:) And after having done over again; and being not well satisfied of some particulars, having put all things in very good order, and being more observant, as possibly I could, of every circumstance taken notice of, did register my several Observations in this Table. In the making of which, I did not exactly follow that I had used at first; but, having lately heard of *M. Boyle's* Hypothesis, I shap'd my course in such sort, as would be more to the examination of that Hypothesis; the event of which I leave to the latter part of the last Table.

The other Experiment was, to find what degrees of force it would take to compress, or condense, the Air into such or such a space.

The manner of proceeding therein was this: I took a Tube five foot long, one of whose ends was sealed up, and bore of a Syphon, much like that represented in the fourth *Scheme*, one side whereof A D, that was open at A, was five inches long, the other side B C, shut at B, was not much longer than five inches; then placing it exactly perpendicular, I put Quicksilver, and found that the Air B C was  $6\frac{2}{3}$  inches long; then pouring in Quicksilver at the longer end, till it was full, filling of it till the Air in the shorter part of it was condensed to the former dimensions, and found the height exactly nine inches; and by making several other tryals, in several degrees of condensation of the Air, I found them exactly answer to the Hypothesis.

But having (by reason it was a good while since I first made them) forgotten many particulars, and being much unsatisfied in other particulars, I did the Experiment over again, and, from the several tryals, collected the following Table: Where in the row next to the height of the Air, signifies the dimensions of the Air, sustaining only the pressure of the Atmosphere, which at that time was equal to a Cylinder of Mercury of twenty inches: The next Figure above it (20) signifies the height of the Air induring the first compression, made by a Cylinder of Mercury 5  $\frac{1}{2}$  inches high, to which the pressure of the Atmosphere being added, the elastick strength of the Air so compressed, was found  $34\frac{1}{6}$ , &c.

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